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Megacities without global functions

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Introduction

1 The new urban revolution, which begun in the second half of the 20th century, and has gathered pace for a quarter of a century, is going to challenge the relation between the size and the economic role of cities. This revolution is mainly characterized by two divergent phenomena.

2 On one side, the last decades have witnessed the emergence and the never seen growth of very large cities. This paper focuses on cities with more than 5 million inhabitants, which are called "megacities", given that this term has no universal meaning (this definition of megacities is more extensive than that adopted by the United Nations). In 1950, 8 megacities in the world represented 58 million inhabitants. In 2005, 49 megacities represent nearly 500 million inhabitants, *i.e.* 7.6% of the world population. Most of them are located in less developed countries[1] (LDCs). The number of cities of more than 10 million inhabitants has grown from 2 in 1950 to 20 in 2005 (UN, 2004).

3 On the other side, the globalization of the economy generates a new urban organization where a few number of cities concentrate a disproportionate part of economic power, essentially through the headquarters of world leading companies, and through finance and other advanced producer services. These global cities, also called world cities or world metropolises, have been analyzed by Hall (1966), Friedman (1986), Sassen (1991, 2000), Lacour (1999) and Bourdeau-Lepage and Huriot (2005), and have been identified and measured in particular by Taylor (2004) and the Globalization and World Cities (GaWC) group and network. Most of the criteria used for identifying global cities refer to the concentration of specialized services – such as advanced producer services of financial services – and to their global interactions. But these activities are only the expression of what we consider as the very nature of the global city, *i.e.* its specialization in the function of coordination.

4 More precisely, we consider that the global city is *a city in a position to realize the economic coordination of complex activities at a global scale*. Though it represents only a minor part of these cities' activities, the coordination function is considered as the major character of global cities. It is through that function that they gain their strategic position in the global economy, and the concentration of this function makes them different from other cities.

5 *Coordination* is thus the first key concept of this paper. "Coordination is defined as the set of interactions between economic agents brought into play in the aim of organizing production, exchange and consumption efficiently" (Bourdeau-Lepage and Huriot, 2005). Coordination is carried out by individual agents themselves and increasingly by specific advanced services.

6 Now megacities and global cities are partly diverging. During the last fifty years, numerous megacities emerged and a large number of them did not gain any global economic dimension or global function. The divergence is particularly marked in the poorest countries. Most of the largest cities are located in the less developed countries, while the global cities are mainly located in the more developed countries. This might be an additional impediment to development, or even a factor of cumulative gap with the richest countries, and an increasing obstacle to the integration of the less developed countries in the global economy.

7 The abundance of contributions dealing with megacities and the richness of the literature on global – or world – cities contrast starkly with the poverty of attempts to investigate this "mega-global divergence". This is probably the consequence of a multiple segmentation of research.

8 First, it is common to separate the demographic nature of the megacities' dramatic growth from the specific economic dimension of the rise of global cities. In point of fact, the problem is less simple because demographic and economic factors are closely linked in both phenomena.

9 Second, the literature on global cities pays little attention to the less developed countries, where most megacities are located, while the literature on megacities describes the disastrous consequences of this over-urbanization in the LDCs in terms of development, but is not very prolix on the conditions of their economic globalization. Thus there is a second clear-cut separation, between economics of development and economics of global cities. This is only a facet of the more general separation between economics of cities, which is mainly focused on city formation and growth in developed countries, and development economics, which for the most part ignores the specific urban dimension of the process of megacity formation.

10 Despite such a confused scientific landscape, one idea is emerging. A general but not exhaustive survey of the two literatures on megacities and on global cities, in the "mainstream" economic theory as well as in the so-called "heterodox" economy, suggests that all the things being equal, the nature and quality of institutions – in the sense of North (1990) – might be decisive in the process of emergence of a global city. Indeed, in a number of poor countries, institutions are actually not able to promote the emergence of global coordination functions.

11 As a consequence, *institutions* is the second key concept of this paper. They can be defined as "the rules of the game in a society, or the humanly devised constraints that shape human interaction" (North, 1990). Formal and informal institutions define and limit the

set of choices of economic agents and determine the form of economic organizations. They favor or discourage exchanges and all forms of interactions, and especially those needed by coordination of economic activity.

12 The paper is founded on the following rationale. The global city is able to coordinate complex global activities. This ability supposes the capacity to interact, to cooperate in accordance with coherent, well established and well accepted rules of the game. These rules are the institutions. They play a large part in the divergence we are interested in.

13 The rest of the paper is organized as follows. First the divergence between the growth of megacities and the development of global cities is characterized more precisely and the relation between this mega-global divergence and the level of economic development is described. Second, some tracks are given for understanding why some megacities in LDCs hardly develop effective global economic functions. Institutional factors including governance, social connectivity, and more generally all kinds of formal and informal rules of the economic and social game are brought in the forefront. The main data concerning the 49 megacities in 2005 are regrouped in the appendix.

The nature of the mega-global divergence

14 Two major transformations affect world's cities: on the one hand, the rise of mega-cities; on the other hand, city globalization, *i.e.* the emergence of cities deciding, operating and interacting at a global scale. The fact is that the largest megacities are not necessary well ranked as global cities, if they are ranked however. What are the nature and the extent of this divergence? Does it simply reflect the more general divergence of development in the present-day economy or is it a specific phenomenon, which obeys to original processes?

The modalities of megacities' inflation

15 The prefix "mega-" means one million, however the minimum size of a megacity is usually supposed to be comprised between 4 and 10 million, depending of the source (Daniels, 2004). The United Nations retain the threshold of 10 million. In this paper we call megacities all the agglomerations of more than 5 million inhabitants. This is in some way arbitrary but this defines a significant set of very large cities in the world. It must be kept in mind that the composition of this set is imprecise: there is a noticeable discrepancy between the estimations of cities' populations coming from different sources [2].

16 On the basis of United Nations data (table 1), there were 8 megacities in 1950 (of which 2 were in LDCs), 26 in 1980 (16 in LDCs), 49 in 2005 (35 in LDCs). In 2015, there will probably be 59 megacities, and 43 will be located in LDCs.

17 The LDC-MDC classification of countries is rather rough, but it gives a first idea of the geographical distribution of megacities.

Table 1. Mega-cities, 1950-2015.

		1950		1980		2005[2]		2015[2]	
	City size[1]	≥ 10	≥ 5	≥ 10	≥ 5	≥ 10	≥ 5	≥ 10	≥ 5
(1)	**World's cities[3]**	**2**	**8**	**5**	**26**	**20**	**49**	**22**	**59**
(2)	Pop.(million)[5]	23.6	58.4	81.0	239.8	291.9	487.8	358.3	615.5
(3)	(2)/urb. pop.(%)	*3.2*	*8.0*	*4.7*	*13.8*	*9.2*	*15.4*	*9.3*	*16.0*
(4)	(2)/total pop. (%)	*0.9*	*2.3*	*1.8*	*5.4*	*4.5*	*7.6*	*5.0*	*8.6*
(5)	**MDCs'cities[3]**	**2**	**6**	**2**	**10**	**5**	**14**	**6**	**16**
(6)	Pop. (million)[4]	23.6	48.0	44.2	107.2	87.9	146.9	101.1	163.2
(7)	(6)/urb.pop. (%)	*5.5*	*11.3*	*5.9*	*14.3*	*9.7*	*16.2*	*10.6*	*17.2*
(8)	(6)/total pop. (%)	*2.9*	*5.9*	*4.1*	*9.9*	*7.3*	*12.2*	*8.2*	*13.3*
(9)	**LDCs' cities[3]**		**2**	**3**	**16**	**15**	**35**	**16**	**43**
(10)	Pop.(million)[4]		10.4	36.8	132.6	204.0	340.9	257.2	452.3
(11)	(10)/urb. pop.(%)		*3.4*	*3.7*	*13.4*	*9.0*	*15.0*	*8.9*	*15.6*
(12)	(10)/total pop. (%)		*0.6*	*1.1*	*4.0*	*3.9*	*6.5*	*4.3*	*7.6*
(13)	**Least DCs' cities[3]**					1	**2**	**1**	**4**
(14)	Pop.(million)[4]					12.6	18.3	17.9	37.2
(15)	(14)/urb. pop.(%)					*6.1*	*8.8*	*5.7*	*11.8*
(16)	(14)/total pop. (%)					*1.7*	*2.5*	*1.9*	*3.9*

[1] Million inhabitants.
[2] Estimates.
[3] Number of cities in the world, in MCDs (most developed countries), in LDCs (less developed countries) and in Least DCs (least developed countries), the definition of which is given in footnote 1.
[4] Total population of these cities.
Source: calculations after United Nations (2004).

18 Such figures must be carefully interpreted. The dramatic rise of megacities in the LDCs must be qualified. It is less dramatic when related to the scale of LDCs' population. Four features must be pointed out.

1. *The weight of megacities population remains weaker in LDCs than in MDCs*, relatively to urban population as well as to total population, and it will still probably remain so in 2015. The same tendency is observed for cities of more than 10 millions inhabitants (table 1, lines 7, 8, 11, 12).
2. *The rise of megacities is both strongly localized* (only a small part of the less developed world is affected) *and extremely rapid.* In its period of most rapid growth, London's population has been multiplied by 7 in 110 years (1800-1910). In comparison, the population of Mumbai has been multiplied by 6 and that of Sao Paulo by 8 in only half a century. Between 1975 and 2000, certain megacities exhibit average annual growth rates never seen in urban history, more often than not over 3% and even over 6% in Dhaka (6.17%) and in Lagos (6.09). This rate is very much lower in MDC's.
3. *Megacities are going to emerge and grow in LDCs, but rarely in the poorest countries.*
   In 2005, only 2 megacities are located in the Least DCs. It could mean that a minimum level of development is required for the emergence of a megacity.
4. *Megacities growth is of a specific nature in LDCs.*
   The explosion of megacities in LDCs results from both the population growth (due to the demographic transition) – and the process of migration (due to economic factors: the gap between urban and rural productivities and incomes, and to sociological reasons: the attraction of the urban way of life). On the contrary, most megacities in MDCs have long been large cities, the growth of which has been much more slow and regular, in close relation with their economic activity (Henry, 2005).

City size and the logic of city globalization

19 From economics of cities (Huriot and Thisse, 2000; Fujita and Thisse, 2002) it can be expected that city size favors city globalization, *all the things being equal.* This can be explained by increasing returns, diversity and externalities.

20 The coordination function of global cities rests on advanced specialized services, which are subject to increasing returns. They are using high-skilled workers and high

interaction abilities. The implementation of these skills and abilities is more efficient at a large scale. It is one of the well-known reasons for the externalization of advanced services and for their concentration in very large cities. Other reasons of this concentration could be added, such as the heavy real estate investments of these firms, and the search for urban amenities and for high levels of culture and education by their skilled workers.

21 These services are intensive users of information. Their global coordination functions put them in connection with the world. The new information technologies make such interactions quasi-instantaneous and potentially unlimited. However, telecommunication infrastructures, them as well, are subject to increasing returns because of important fixed costs, and thus they are not present everywhere, but only in very large cities (Bourdeau-Lepage and Huriot, 2005).

22 City size usually goes along with urban diversity, which is a source of interactions and of externalities, related notably to proximity and to information exchanges. Size and diversity are also factors of a good match between supply and demand of skills on the labor market.

23 The relation between city size and the correlative presence of diversity and of externalities on the one hand, and city globalization on the other hand, is circular and cumulative, so that city globalization causes city globalization and the process is more or less locked-in.

24 The next subsection states that the empirical relation between city size and city globalization does not fit so well the preceding theoretical statement.

Characterizing the divergence

Size and global functions

25 The global performances of a city are not closely linked to its size. The GaWC group proposes different evaluations of such performances. One of them is based on the presence of global firms in four categories of advances services (Beaverstock *et al*. 1999). It leads to the selection of 123 cities, the scores of which vary from 12 (the top level of the "alpha world cities") to 1 (the lowest level, "minimal evidence of world city formation"). This grading will be referred to under the name "global advanced services" (GAS).

26 There is no clear evidence of a strong positive relation between these global scores and the sizes of the 123 cities.

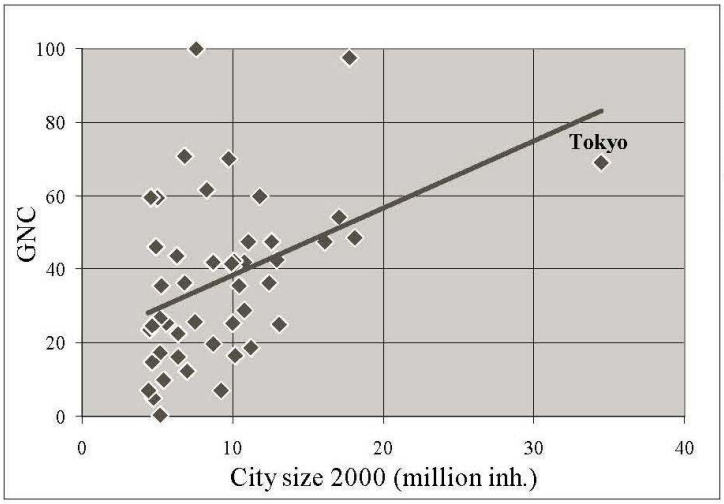
27 First, a significant part of the best-ranked cities in the GAS grading are not megacities. Some of them, especially in Europe, have around 1 million (Zurich, with a score of 9, Brussels, 8, Amsterdam and Geneva, 6).

28 Second, a large part of the megacities has low global scores. Among the 49 megacities registered in 2005, only 15 have scores of 6 and more and 34 have scores less than 6. Among the latter, 15 have a null score: they have no evidence of any global function and are not included in the GAS grading. Even the largest megacities (of more than 10 million) are not necessarily global cities. Only 8 of the 20 largest megacities have global scores of 6 and more, and 4 (Calcutta, Dhaka, Karachi and Lagos) remain out of the GAS grading.

29 It results that *size seems to be neither a necessary nor a sufficient condition for obtaining the status of global city*.

30 A more precise GAWC classification confirms this statement. It is based on the level of global interactions between cities (Taylor *et al.*, 2002). Interactions in a set of 100 global firms in 6 advanced services localized in 315 cities are indirectly estimated for 2000. The resulting "global network connectivity" (GNC) that characterizes each of the 49 megacities is expressed in percentage of the score of the best connected city, London. There is only a weak correlation between megacity size in 2000 and GNC (figure 1). The determination coefficient is significant but low (0.165).

Figure 1. Global network connectivity and size of megacities in 2000.



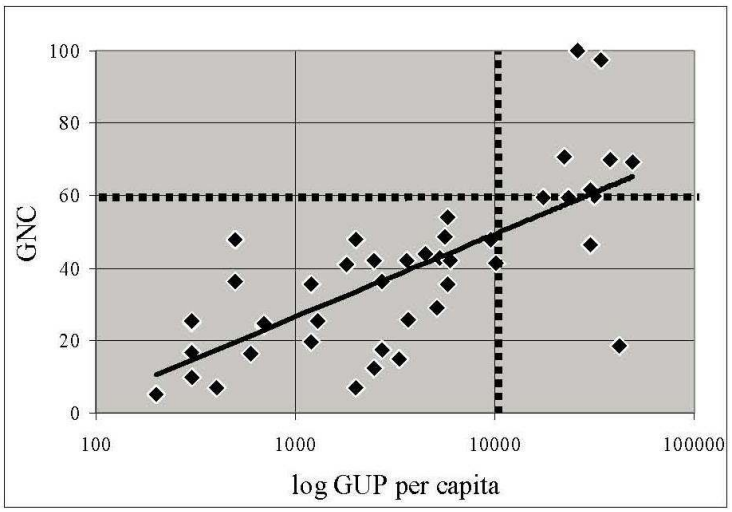
Observ.	47
Constant:	20.191
Regr. coeff.	1.823
t	3.174
p	0.003
r^2	0.165
Significance	***

31 Without the extreme case of Tokyo, the determination coefficient is even smaller (0.144). This is not a surprising feature. Even if it is a favorable factor, the quantity of people cannot as such generate the ability to coordinate complex economic activities at a global scale. The global functions of megacities may certainly be better correlated with the level of economic development.

Global functions and economic development

32 Global functions of megacities are reasonably expected to depend of their economic performances. Given the scarcity of data on development at the urban level, we can use the results of the important work by Moriconoi-Ebrard (2000) despite the fact they were obtained for 1995. Moriconi-Ebrard calculated the gross urban product for all the cities of more than 2 million inhabitants. Figure 2 relates the GNC to the logarithm of the GUP (gross urban product) per capita. The use of the logarithm reflects the well-known decreasing marginal effect of an increasing product per capita. The regression is good, with r^2 equal to 0.511 and a good significance.

Figure 2. Global network connectivity of megacities and log GUP per capita.



33 As expected, if the logarithm of the GUP per capita is replaced by the logarithm of the GDP per capita of the corresponding country, the regression is less good, with r^2 equal to 0.423. The global network connectivity level of a city is more closely linked with the level of economic development of the city than with the level of development of the country.

34 Surprisingly enough, the determination coefficient is even smaller (0.414) when the GNC is related to the human development index (HDI, see appendix), though this index includes the level of education and the life expectancy besides the logarithm of the GDP per capita. These human components give an evaluation of the skill level and of the quality of life and one could have expected that they have an effect on city globalization. This primacy of economic factors is not surprising, as far as the criteria of globalization are themselves strictly economic. But it does not exclude the role of other factors, like institutions, which condition economic performances.

35 Examination of the scatterplot gives additional information. Most points occupy only the left lower and the right higher parts of the graph, limited by the doted lines. No megacity with a GUP per capita inferior to 10,000 $ can reach a global network connectivity of at least 60 (London= 100). It means that no megacity exhibits high global performances together with a low degree of development; in other words, all the megacities with a low development level have weak global performances. Conversely, only a small number of megacities are immersed in a high developed environment without being important global cities. The extreme case of Osaka-Kobe (at the right bottom of the graph) may be explained by the "shadow effect" due to the proximity of one of the leading global cities, Tokyo.

36 Such an effect may be more general. If only one city per country is retained (that with the highest global network connectivity), the regression gives even best results, with r^2 equal to 0.856 (0.511 with all megacities), and with a good significance. This means that the relation between the global performance and the level of economic development is closer for the subset of the *leading* global megacities of each country than for the set of all the megacities. This is a form of shadow effect: secondary global cities may have lower global performances even if they have very good economic performances.

37 Finally, there is a close relation between the economic development and the global performances of a megacity. This diagnosis is reinforced by examining performances in a more specific field that is particularly crucial for city globalization: transport and communication.

38 Two series of data converge to show that world's air traffic is highly concentrated in the more developed regions of the world, between these regions and between their megacities.

39 1/Air flows internal to Europe and to Northern America account for nearly the half of the total world traffic, while 1.3% of this total is internal to Sub-Saharan Africa and less than 1% to South Asia. 8% of the world traffic connects Europe and North America while 0.6% connects North America and South Asia and 0.3% connects North America and Sub-Saharan Africa (Witlox *et al*., 2004).

40 2/At the level of the megacities themselves, in percentage of the London traffic (the most important of the world), Calcutta traffic represents 3% and Lagos 2.9%. Half of the megacities have each less than one tenth of the London traffic (from Airport Council International, preliminary report for 2005).

41 The same tendency can be noted concerning the new communication technologies. For example, the United States have 63 internet users per 100 inhabitants, India 3.24, Nigeria 1.4, Pakistan 1.3, Bangladesh 0.2 and the Democratic Republic of Congo 0.1 (International Communication Union, data for 2004).

From development to institutions

42 The data presented above do not exactly correspond to what could be expected from the theoretical role of city size, and the level of economic development seems to play an important role in the emergence of global functions in a large city. No global city can emerge without a minimum level of development. But the direction of the eventual causality is hardly identifiable. Wondering whether underdevelopment blocks city globalization or if the explosive growth of megacities hampers development is not clearly relevant. The two processes are not exclusive, on the contrary, they are mutually reinforcing in a cumulative process, like in the case of the more general linkage between development and urbanization[3].

43 Actually, the theoretical relation between city size and city globalization rests on implicit assumptions. Indeed, city size is a factor of city globalization only if it is able to create sufficient diversity, skills and information externalities to permit the emergence of global coordination functions. *That means city globalization is subject to the existence of coordination capacities, and of the ability to implement – and to take advantage of – increasing returns and information externalities.* This depends largely on institutions. If the level of development is a significant factor of city globalization, it is probably mostly because of the nature and the quality of institutions. It will be illustrated in the next section.

Institutions matter

44 Although they are really present in less formal analyses, institutions have still made only a discreet entry in economics of cities. Theory and the analysis of the preceding sections suggest that institutions matter, because global performances depend on coordination,

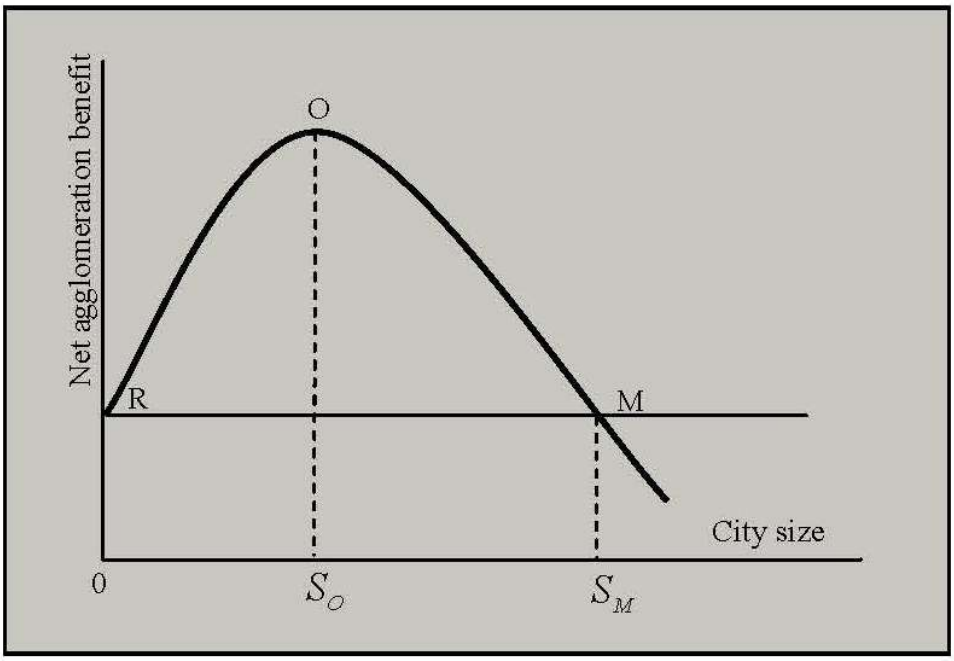
which depends notably on the form of governance and the level of social connectivity. It is illustrated by the role of corruption and of the informal sector.

Institutions and economics of cities

45 The disproportionate growth of megacities and the formation of global cities have generated a vast literature. But the possible divergence between the two phenomena has been largely neglected, even by economics of cities, although it deals with each of them. The mega-global divergence is not really tackled. Most of that part of economics of cities, which treats the emergence of megacities, is limited to three main questions.

1. *Under what conditions can a city reach the size of a megacity?*
   Concentration of people and activities in a city always results from a tension between centripetal forces – agglomeration economies – and centrifugal forces – agglomeration costs or diseconomies. When city grows, the resulting net benefit (or the utility) of a representative agent is represented by an inverted "U" like curve ROM on figure 3 (Henderson, 1974; Fujita *et al*, 1999).
   This suggests the existence of an optimal size S_o. But the probability of realization of that size depends on the mode of coordination of agents. In a self-organizing city, where individual agents maximize their private benefit in a non-cooperative game, the city size can increase up to the maximum S_M. If there is too few cities, and thus too large cities, the typical city is larger than S_o. In such a city, no individual agent will decide to move to another place, given that other individuals do not move, because this city yields a higher benefit than OR, which can be obtained in any isolated (or rural) place. On the contrary, this city can still attract new migrants from rural space or from small cities, until it reaches the maximum size S_M.
   However, cooperation between agents, or centralized coordination by a "large agent" (developer or local government) can incite a number of people to move simultaneously to a new city where agglomeration benefit is at least that of the initial one. The condition is that those who coordinate this move can profit from the new situation, by getting back the new agglomeration benefits. These ideas have been developed for example by Henderson and Mitra (1996), Becker and Henderson (2000) and Venables (2003).
2. *Under what conditions can a system of cities be unbalanced, i.e. have a strong primacy?*
   A number of contributions (for example Ades and Glaeser, 1995; Krugman and Livas Elizondo, 1996; Puga, 1998; Duranton, 2000) stress the importance of a variety of factors of primacy, most of which are present in developing countries. Among them, institutional elements (mainly governance) are not inconsiderable. However, primacy is weakly linked with the megacity phenomenon. First, certain countries contain several megacities (Japan, the United States, India, China), so that the primacy index cannot be defined for every megacity. Second, the degree of primacy of the countries concerned is extremely variable: the share of the primate megacity's population in the total urban population of its country varies between 2.4% (Shangai in China) to 42.1% (Tokyo in Japan); and third, this gives no insight at all into the mega-global divergence.
3. *Under what condition does a megacity emerge without any economic growth?*
   Duranton (2000) shows that a high primacy configuration (and even a unique megacity) can emerge with no growth if the city system is centrally planned by a monopolist agent and/or if the fertility rate is high (*i.e.* if the rate of population growth is high). The role of institutions is decisive, through the more or less central management of the city system. This contribution half-opens the door of the mega-global divergence.

Figure 3. City size: optimum vs maximum.



46 Finally, although most authors leave the mega-global divergence out, *they all need calling for some institutional elements to explain urban growth and/or the phenomenon of megacities*, with or without growth. Ades and Glaeser (1995) corroborate empirically the role of these elements in the emergence of "urban giants" in 85 countries.

47 From these analyses, and from the results concerning the relations between city size, city globalization and development, we can draw the following hypothesis. *As far as the global city's main function is coordination, city globalization depends on the institutional organization of the economy, on urban institutions and on constraints affecting individual interactions.*

Institutions, governance, social connectivity and coordination

48 The ability to global coordination is a necessary condition for a city to gain the status of global city. This ability is measured by the presence of advanced services and by their global influence. The cumulative logic of the corresponding agglomeration process is known. However this logic remains virtual if the rules of the game of the society do not permit their effective running.

49 In the framework of the new institutional economics, these rules are represented by institutions. In this meaning, institutions include all forms of governance, as defined by United Nations Center for Human Settlement (2001): "Governance is much more than government. At the city level, it can be defined as the sum of the ways through which individuals and institutions (public and private) plan and manage their common affairs."

50 In the digital era, institutions also include what Sassen (2000) calls the social connectivity, which represents the set of individual and social capacities to use efficiently information technologies for coordinating and controlling the economy. "To maximize the benefits of the new information technologies, you need not only the infrastructure but a complex mix of other resources. Most of the value-added which these technologies can produce for

advanced service firms lies in the externalities. And this means the material and human resources – state-of-the-art office buildings, top talent, and the social networking infrastructure that maximize connectivity. Any town can have the fiber optic cables. But do they have the rest?"

51 This is the core of the question. But it is necessary to go further in recognizing that all the cities cannot have technical infrastructures, for lack of money and of human resources. This is a matter of fact. In 2003, the United States had 76 personal computers per 100 inhabitants., Pakistan, Nigeria and Irak had less than one (International Communication Union). Among the cities, which could have technical infrastructures, some do not have the social connectivity required for their implementation. Without social connectivity, there is no global coordination. Institutions are a decisive factor.

52 Institutions can be formal or informal. Their role is illustrated in three points: the efficiency of formal institutions, the conflict between formal and informal institutions, and the complementarity between formal and informal institutions.

The efficiency of formal institutions

53 Formal rules of the game include political, legal rules and economic rules relative to property rights and contracts. They aim at facilitating exchanges and cooperation, whatever their nature, provided that their consequences are judged positive by the society (North, 1990). One important aspect of this aim is the enforcement of contracts. Institutions must generate the trust required for the carrying out of exchanges. Yet, "the inability of societies to develop effective, low-cost enforcement of contracts is the most important source of both historical stagnation and contemporary underdevelopment of the Third World" (North, 1990).

54 The concept of "good institutions" (or even of "good governance") can be left out because it is not clearly defined, because it depends strongly on the objective and the point of view of those who define it, and therefore because it is more often than not full of ideology. Among the governance, which permits the participation to the globalization movement, and the governance which is efficient to promote sustainable development with or without globalization, what is the best? The aim of this paper is not to judge institutions or governance, but to evaluate their capacity to promote city globalization. Consequently, institutions are positively evaluated when they make global coordination of complex operations possible, *i.e.* when they favor complex and global interactions and exchanges.

55 Even if it does not treat megacities *stricto sensu*, the study of Keivani *et al.* (2003) is a good illustration of these relations between coordination, interactions and institutions. It shows the effect of institutions on the globalization process of certain LDC's cities, namely cities of the United Arab Emirates: Abu Dhabi, Dubai and Sharjah, in comparison with Singapore. Institutions are grasped through the modes of coordination and the nature and characteristics of public institutions. A survey was conducted on the perception of the quality of institutions in the two sets of cities. Remark that formal and informal institutions are hardly strictly separable in such a survey. Indeed, the judgment on formal institutions may be influenced by the informal practices.

56 The results confirm the central role of institutions in economic development and in the global functions of a city. In Singapore, institutions and their coordination capacities

appear much more adapted to the global economy. In the United Arab Emirates, governance is more centralized and even monopolized; interactions and cooperation between departments and institutions are rather weak, and inside and outside communication is judged insufficient. Moreover, the business environment is more stable in Singapore. This could be correlated with the fact that the Emirates have no real global city, despite their privileged location in the Middle East. Indeed, GAS grading (scores varying from 1 to 12) gives the score 2 to Abu Dhabi and Dubai ("some evidence of world city formation") while Singapore obtains 10 and is included in the top 10 global cities in the world ("alpha world cities"). GNC grading (global network connectivity, see section 2) is equal to 36.3 in Dubai, 20.9 in Abu Dhabi and 64.5 in Singapore.

Formal and informal institutions in conflict: the case of corruption

57 "In our daily interactions with others, whether with family, in external social relations, or in business activities, the governing structure is overwhelmingly defined by codes of conduct, norms of behavior and conventions" (North, 1990). An informal convention becomes a social constraint when almost everybody follows it and if it is in the interest of each individual that all other individuals follow it provided that the individual does too (North 1990).

58 Informal rules are particularly important in LDCs and in medium or low HDI countries, but they are far from being absent in MDCs. In LDCs, formal rules usually cohabit with informal rules. Despite the importance of formal rules, informal rules are often stronger and more durable and they frequently have the final word. In the economy, the two sets of rules, formal and informal, are in conflict or in cooperation in production activities, in the modes of exchange, in land tenure rules or in housing conditions. The formal rules of the market can be in conflict with traditional conventions (individual haggling procedures) or with corruption.

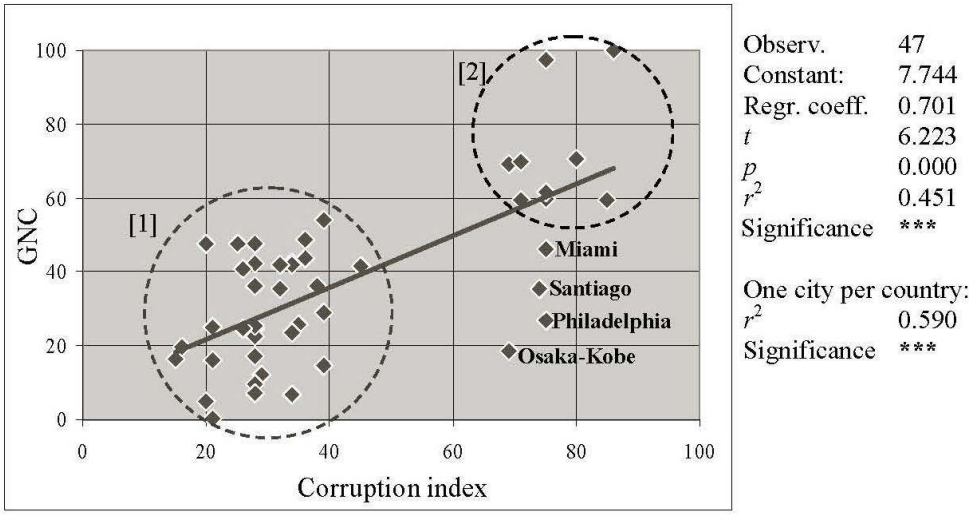
59 Corruption rests on rules that differ radically from those governing globalization. Corruption is defined as "a crime perpetrated by officials who misuse public office for private gain, and, at an aggregate scale, denies citizens their right to self-determination" (United Nations Center for Human Settlement, 2001). Corruption is more probable where an official has a monopoly power, a discretionary authority and lack of accountability. It is less probable where the "ethical ambiance" (that is "the social norms relating to the public interest") is high. It discourages entrepreneurship, disfavors foreign investments and international interactions, and makes global coordination more difficult (Bourdeau-Lepage and Kolarova, 2005).

60 Corruption is widespread in developing countries (Transparency International, 2005). It is negatively correlated with the degree of urbanization of countries. (United Nations Center for Human Settlement, 2001, from a sample of 85 countries). It could be because "urbanized societies require more accountability and more transparency of public officials" (UNCHS, 2001).

61 Figure 4 relates the scores of all megacities in terms of global network connectivity to the 2004 index of perceived corruption proposed by Transparency International (2005). This index is a decreasing function of the level of corruption: a low index means high corruption; it is evaluated at the national level. The analysis gives two results.

62 First, the regression is good, with a determination coefficient of 0.451 and significant.

Figure 4. Global network connectivity and corruption.



63 Second, there is a clustering of points in the scatterplot. Most cities are distributed between 2 clusters: in cluster [1], GNC and corruption index are smaller than sixty; for all cities but one (Seoul) the corruption index is even smaller than 40; in cluster [2], GNC and corruption index are greater than sixty. Only four cities remain outside the clusters: Miami, Santiago, Philadelphia and Osaka-Kobe: they have good corruption indices and weak global performances. For three of them (Miami, Philadelphia and Osaka-Kobe), it may come from their position in the shadow of one of the major global cities in the world. No megacity has both a high corruption level and high global performances. Thus *it seems that, in the set of megacities, high corruption is rather associated with bad global performances and low corruption with good global performances*. Moreover, in cluster [1] (bad corruption index and low global performances), all the cities but one (Seoul) have a gross urban product per capita less than 10,000 $, while all the cities but one (Santiago) with a good corruption index have a gross urban product per capita higher than 10,000 $.

64 To sum up, there is a close correspondence between three variables: the corruption index, the global network connectivity and the gross urban product.

65 Corruption is an informal rule of the game and as such it is stronger and more durable than formal ones. Consequently, corruption can hardly be eliminated through formal ways only. Anti-corruption barriers could be inefficient if mentalities do not change (Bourdeau-Lepage and Kolarova, 2005).

66 The cohabitation of formal and informal rules is also observed in the case of formal and informal sectors. In this case, the two sets of rules are more complements than in conflict.

Formal and informal institutions in cooperation: the informal sector

67 Informal sector, informal employment, informal economy, are extremely difficult to define, and even much more difficult to measure, actually because they refer to something informal[4]. Informal sector can be tolerated or even encouraged. It includes a great variety of legal activities – from itinerant street vendors to industrial micro-enterprises and computing and telecommunication services – and of illegal activities such as drug dealing, smuggling, gambling or prostitution.

68 Informal sector has ever existed, even in the most developed countries. But nowadays it takes a dramatic extent in the LDCs. Despite statistical difficulties, United Nations Habitat provides some data (which are only approximate) for a sample of world's cities, among which 11 megacities, essentially in LDCs. Employment in the informal sector represents a large part of these cities' total employment, with peaks of more than 60% in Delhi and Dhaka (table 2).

69 The role of the informal sector in the mega-global divergence is hard to identify and probably multiple. What follows only suggests some reflection avenues to be more thoroughly investigated.

Table 2. The share of the informal sector in city employment.

City	Country	% of total employed population in the informal sector
Delhi	India	65.70%
Dhaka	Bangladesh	63.00%
Lahore	Pakistan	50.70%
Rio de Janeiro	Brazil	40.10%
Bangalore	India	34.20%
Jakarta	Indonesia	30.00%
Sao Paulo	Brazil	25.40%
Moscow	Russian Federation	25.10%
Bangkok	Thailand	17.00%
Buenos Aires	Argentina	10.30%
Tokyo	Japan	0.00%

Source: UN-Habitat, urban indicators for 1998 (www.unchs.org/programmes/guo/guo_indicators.asp)

70 The informal sector may be both a product and a reinforcing factor of megacity growth without economic growth, observed in a number of LDCs. But first of all it involves a particular form of self-organization that permits the survival of a population the size of which is disproportionate to the economic resources of the megacity. In other words, it makes possible the survival of a mass of new immigrants thanks to the implementation of original institutions. The informal sector is by nature the domain of informal rules, which regulate also slums, shantytowns, favelas and other informal human settlements. All these informal elements can be regrouped in the terms "informal society".

71 The informal society is usually considered as composed of marginal individuals, of people excluded from the "normal" society. In fact, things are less simple. In the informal society of a number of LDCs (especially but not only in Africa), exclusion is not only destructive but also creative (Baron, 1995; Huriot, 1997). One can be excluded only from a particular and well-defined set of rules. But the victims of exclusion can create their own norms, their own rules of the game, their own institutions. Informal employment is not anarchy. It is organized on the basis of coherent and accepted institutions. Moreover, it is generally connected to the formal sector, directly of indirectly: formal employees may

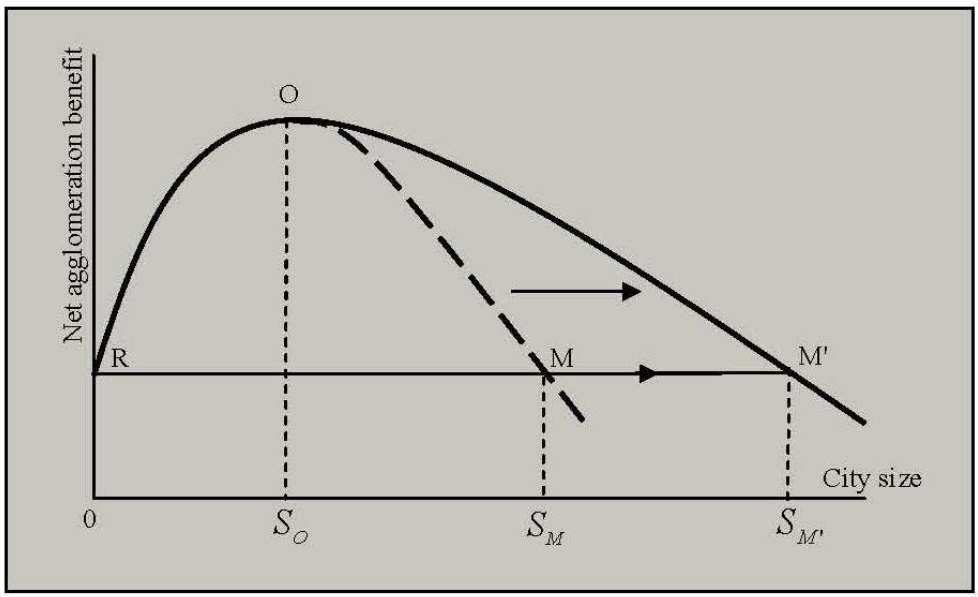
have a second informal job, the informal production is sold to formal workers, and informal workers spend their income on formal markets (Daniels, 2004).

72 The organization of the urban informal sector as a survival sector leads to the following hypotheses.

1. Certain megacities of the LDCs are subject simultaneously to two different institutional systems, two forms of coordination built on different cultural foundations. These systems interact in cooperation or in conflict. Institutional incoherence and conflict can reinforce the lack of coordination and exacerbate urban growth without economic growth, thus more or less directly aggravate the mega-global divergence.
2. Informal society is organized
   - in order to enable the rural migrant to survive with an income level and a standard of living higher than the rural ones, even if they are lower than in the urban formal sector (note that some informal incomes may be relatively high, especially in illegal activities);
   - so as to maintain and encourage a massive immigration from hinterland, *i.e.* to support a huge urban growth, incommensurable with the formal economic potential of the megacity.

73 The latter proposition on megacity growth could be illustrated intuitively by figure 5, built on the basis of figure 3. It can be assumed that the existence of an important informal survival sector maintains a positive net benefit of agglomeration for larger sizes. The decrease of these benefits is less rapid with an increasing city size and the new net benefit curve is ROM'. In absence of any large agent and any efficient cooperation, the city can continue to grow up to the size $S_{M'}$ which might be much higher than the maximum size S_M without informal sector. This is a very simplified illustration of a *possible* effect, by no means a demonstration.

Figure 5. Potential city size with informal sector.



74 Informal society could contribute to the understanding of the simultaneity of two phenomena: the overwhelming growth of certain megacities and the lack of efficient urban coordination, and therefore the lack of global coordination. One of the reasons is

that the informal sector permits the survival of a large number of immigrants so that it maintains immigration and urban growth despite poverty and underdevelopment.

75 In return, the informal sector may be a source of stagnation. It develops essentially in low technology industry, small retailing, low order services, and execution activities. It is rarely creative and innovative. In addition, the administrative sector has generally overdeveloped in most LDCs since decolonization, and low order services are overrepresented in the private formal tertiary sector ("pseudo tertiary sector" – Wackermann, 2000). Consequently, the conditions of city globalization may still be far away.

Conclusion

76 Bairoch (1988) emphasizes the "urban inflation" of the "Third World". Sassen (1991, 2000) stresses the emergence and growing domination of global cities. Contrary to urban growth in the 19th century in Europe, in many cases the urban inflation in poor countries is cut off from economic growth or development. Contrary to the megacities in the LDCs, most megacities in MDCs are well rated global cities. This divergence has an important economic issue in the context of present evolution of the world's economy. To be a global city is a condition for the access to economic power. It makes possible the participation to strategic economic decisions, and permits a better economic integration (Bourdeau-Lepage, 2005). However, city globalization may well be a factor of growth of a new kind of inequalities, not only between cities, but between nations, and can contribute to the formation of a "new geography of centrality and marginality" (Sassen, 2000).

77 The core of this paper is the relation between coordination and institutions. In order to be able to coordinate complex and global activities, the cities candidates to globalization must have technical resources and infrastructures, high skills and above all formal and informal institutions well adapted to this objective. As a consequence, the nature of institutions is crucial for the understanding of the mega-global divergence.

78 Finally, the mega-global divergence is directly or indirectly related to the level of development of the countries where megacites are located, which seems to confirm Polèse's position that cities are the products of national economic growth (Polèse, 2005), but it is more closely related to the economic performances of the megacities themselves. Moreover, this paper suggests that megacities in LDCs, even if they depend on national characteristics, can in return be significant obstacles to development, because they generate or favor the emergence of specific informal organizations and institutions. The informal sector may generate the conditions of durability of a dramatic urban growth without economic growth.

79 The avenues suggested in this paper might be conducted further and more deeply. It appears that megacities in LDCs and in MDCs obey to different processes and are probably of different natures. A number of studies show that global cities differ from one region to the other in the world, in terms of functional specialization (Taylor, 2003). It could be added that LDCs megacities, follow two very different scenarios.

80 The first scenario maintains these cities in a cumulative process of under-equipment and under-development. It has been largely evoked above. It concerns mainly the megacities of Africa and of the poorest countries.

81 In the second scenario, certain megacities of South Asia, Pacific Countries, China and Latin America are entering in global business. Of the 20 present largest megacities, Mexico City, Sao Paulo, Mumbai, Jakarta and Cairo (by decreasing population order) show some signs of globalization (Gugler, 2004). Important financial places, business centers and rich enclaves appear in a number of "poor" megacities. Even in Africa, some cities are going to gain an international dimension (Van der Merwe, 2003).

82 These are only signs. It does not necessarily mean that the obstacles underlined above are got over, and that from now on institutions are well suited to global coordination functions. Conversely it cannot be excluded that the present mega-global divergence would be only a transition phase, and that a number of LDCs'megacities would follow a catching up process. Such transformation would change radically the geography of centrality and marginality evoked by Sassen (2000).

HUMAN DEVELOPMENT INDEX

The Human Development Report 2005 (United Nations Development Program, 2005) defines the HDI as "a summary measure of human development. It measures the average achievements in a country in three basic dimensions of human development:

- A long and healthy life, as measured by life expectancy at birth.
- Knowledge, as measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary and tertiary gross enrolment ratio (with one-third weight).
- A decent standard of living, as measured by GDP per capita (PPP US$)." (341)

For technical details, see United Nations Development Program (2005), page 341.

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APPENDIXES

MEGACITIES, SELECTED DATA

Megacities	Country	Popul. 2005 (1)	GUP (2)	Air traffic (3)	Web users (4)	PCs (5)	GAS (6)	GNC (7)	Corruption (8)
1 Tokyo	Japan	35.3	49300	77.0	50.2	54.2	12	69.1	6.9
2 Mexico city	Mexico	19.0	5800	17.3	13.4	10.7	8	48.6	3.6
3 New York-Newark	USA	18.5	34100	67.9	63.0	76.2	12	97.6	7.5
4 Sao Paulo	Brazil	18.3	5800	10.7	12.2	10.7	8	54.1	3.9
5 Mumbai (Bombay)	India	18.3	500	10.3	3.24	1.2	3	47.7	2.8
6 Delhi	India	15.3	500	7.6	3.24	1.2	3	38.3	2.8
7 Calcutta	India	14.3	300	2.4	3.24	1.2	0	24.9	2.8
8 Buenos Aires	Argentina	13.3	9500	7.4	16.1	8.0	4	47.7	2.5
9 Jakarta	Indonesia	13.2	2000	13.2	6.5	1.4	6	47.7	2.0
10 Shanghai	China	12.7	5300	21.6	7.2	4.1	4	42.8	3.4
11 Dhaka	Bangladesh	12.6	300	2.5	0.2	1.2	0	16.6	1.5
12 Los Angeles	USA	12.1	31500	47.9	63	76.2	10	59.9	7.5
13 Karachi	Pakistan	11.8	1300	3.6 (9)	1.3	0.4*	0	25.3	2.1
14 Rio de Janeiro	Brazil	11.5	5100	4.9	12.2	10.7	3	26.9	3.9
15 Osaka-Kobe	Japan	11.3	41900	14.7	50.2	54.2	6	18.6	6.9
16 Cairo	Egypt	11.1	1200	7.3	5.6	3.3	2	35.4	3.2
17 Lagos	Nigeria	11.1	1200	2.5	1.4	0.7	0	19.7	1.6
18 Beijing	China	10.8	2500	23.4	7.2	4.1	5	42.0	3.4
19 Moscou	Russian Fed	10.7	3600	11.8	11.1	13.2	7	42.2	2.8
20 Metro Manila	Philippines	10.7	1800	10.9	5.3	4.5	4	40.8	2.6
21 Paris	France	9.9	38000	61.0	41.2	48.7	12	69.9	7.1
22 Istanbul	Turkey	9.8	6000	11.6	14.1	6.1	4	42.1	3.2
23 Seoul	Rep of Korea	9.6	10200	32.6	65.7	54.5	7	41.5	4.5
24 Tianjin	China	9.3	2000	0.8 (10)	7.2	4.1	0	7.0	3.4
25 Chicago	USA	8.7	30400	71.5	63.0	76.2	10	61.6	7.5
26 Lima	Peru	8.2	3700	3.7	11.6	9.7	2	25.8	3.5
27 London	United King	7.6	26000	100.0	62.9	60.0	12	100.0	8.6
28 Santa Fe de Bogota	Colombia	7.6	2700		8.9	5.5	2	36.2	3.8
29 Tehran	Iran	7.4	2500		7.9	10.5	1	12.2	2.9
30 Lahore	Pakistan	7.4	600	1.9 (9)	1.3	0.4*	0	16.1	2.1
31 Hong Kong	China, H.K.	7.2	22400	28.6	50.3	60.5	10	70.7	8.0
32 Chennai (Madras)	India	6.9	300	3.5	3.2	1.2	0	22.5	2.8
33 Bangkok	Thailand	6.6	4500	27.5	11.6	6.0	5	43.7	3.6
34 Rhein-Ruhr North (11)	Germany	6.6		0.9	42.7	48.5	0		8.2
35 Bangalore	India	6.5	300	2.5	3.2	1.2	1	25.4	2.8
36 Hyderabad	India	6.1	300	1.6	3.2	1.2	0	9.7	2.8
37 Wuhan	China	6.0	2600		7.2	4.1	0		3.4
38 Bagdad	Iraq	5.9	1500		0.1	0.8	0	0.5	2.1
39 Kinshasa	Rep of Congo	5.7	200	0.3	0.1		0	4.9	2.0
40 Santiago	Chili	5.6	5800	4.8	27.9	13.9	0	35.5	7.4
41 Riyadh	Saudi Arabia	5.5	700		6.4	34.0	2	23.8	3.4
42 Miami	USA	5.4	30300	25.6	63.0	76.2	4	46.3	7.5
43 Philadelphia	USA	5.3		20.7	63.0	76.2	3	26.8	7.5
44 Saint Petersburg	Russian Fed	5.3	2700	2.7	11.1	13.2	1	17.2	2.8
45 Belo Horizonte	Brazil	5.3	3300	0.4	12.2	10.7	0	14.7	3.9
46 Ahmadabad	India	5.2	400	0.7	3.2	1.2	0	7.0	2.8
47 Madrid	Spain	5.1	17400	28.9	33.2	25.4	8	59.4	7.1
48 Toronto	Canada	5.1	23400	22.1	62.4	69.9	9	59.5	8.5
49 Ho Chi Minh City	Viet Nam	5.0	700	4.6	7.12	1.3	2	24.8	2.6

Blank cells correspond to lacking data. (1) United Nations (2004), estimates, million inhabitants. (2) Gross urban product per capita, Moriconi-Ebrard (2000), data for 1995. (3) Calculated from Airport Council International, data for 2002-2003, in % of London traffic. (4) International Communication Union, web users per 100 inh., data for 2004. (5) International Communication Union, personal computers per 100 inh., data for 2004, * for 2003. (6) Beaverstock et al. (1999), scores depend on the presence of global firms of advanced services in 4 sectors. (7) Global network connectivity, Taylor and Catalano (2001), 10 x (global network connectivity). (8) Corruption perception indicator, Transparency International (2005), this indicators varies from 0 (highly corrupted) to 10 (highly clean), data for 2004. (9) Calculated from Civil Aviation Authority, Pakistan, data for 2002-2003 (10) Calculated from People Daily, January 16, 2001, data for 2000. (11) Including Duisburg, Essen, Krefeld, Mulheim, Oberhausen, Bottrop, Gelsenkirchen, Bochum, Dortmund, Hagen, Hamm and Herne.

NOTES

1. This results from the United Nations' distinction between "more developed countries" (MDCs : Northern America, Japan, Europe and Autralia/New Zealand), and "less developed countries" (LDCs : the rest of the world, i.e. Africa, Asia (Excluding Japan), Latin America and the Caribbean, Melanesia, Micronesia and Polynesia). Among LDCs, 49 countries are considered as "least developed countries" (Least DCs), of which 34 are in Africa, 9 in Asia, 1 in Latin America and the Caribbean and 5 in Oceania (United Nations, 2004).

2. Even if most sources refer to the concept of agglomeration rather to that of cities, estimation can differ markedly. An extreme case is Seoul, the estimated population of which varies in 2000 from 9.6 million (United Nations, 2004) to 20.7 million (Moriconi-Ebrard, 2000; quoted by Henry, 2005). Consequently, the number of megacities is only a rough estimate.

3. However, the problem is quite different, because we are interested only in megacities, and such cities may appear in countries with relatively low urbanization rates (ratios of urban population to total population).

4. Definitions of the informal sector are multiple and differ from one country to the other (Daniels, 2004). Moreover, informal employment must be distinguished from employment in informal sector, as far as there is informal employment in the formal sector too. Anyway, this sector does not respect at least one of the MDCs' dominant rules concerning enterprise, labor market, salaries and workers' rights. It is generally non-registered and continually changing, and thus hardly measurable.

ABSTRACTS

Present urban evolution is characterized by two major phenomena. On the one hand, the number of very large cities, the megacities, increases dramatically, especially in the less developed countries (LDCs). On the other hand, globalization leads to the emergence of cities coordinating complex and global economic activities, the global cities, especially in the more developed countries (MDCs). So, the two phenomena are diverging. A number of megacities do not exhibit any global function.
The global performances of megacities are well correlated with their degree of economic development. But it is worth wondering why economic underdevelopment is consistent with urban growth but not with city globalization.
The paper develops the following arguments. The global city is able to coordinate complex and global activities. This ability supposes the capacity to interact, to cooperate in accordance with coherent, well established and well accepted rules of the game, i.e. with institutions. These rules play a large part in the mega-global divergence. The bad quality of governance, the low level of social connectivity, the high level of corruption, are important obstacles to city globalization in LDCs. The existence of an important informal sector may explain that cities in LDCs grow beyond the size compatible with their economic resources and with their ability to generate externalities favourable to city globalization.

L'évolution urbaine contemporaine est marquée par deux phénomènes. D'une part, le nombre des très grandes villes, les mégapoles, augmente rapidement, tout particulièrement dans les pays moins développés. D'autre part, la globalisation fait émerger des villes qui coordonnent les activités économiques complexes et globales, les villes globales, tout particulièrement dans les pays plus développés. Ainsi, les deux phénomènes divergent. Un grand nombre de mégapoles n'ont aucune fonction globale.
Les performances globales des mégapoles sont bien corrélées à leur niveau de développement économique. Mais on peut se demander pourquoi un faible niveau de développement est compatible avec la croissance urbaine et pas avec la globalisation urbaine.
Le papier développe l'argumentation suivante. La ville globale est en mesure de coordonner les activités complexes et globales. Cette capacité suppose la possibilité d'interagir, de coopérer en accord avec des règles du jeu bien établies et acceptées, c'est-à-dire les institutions. Celles-ci jouent un rôle important dans la divergence méga-global. La mauvaise qualité de la gouvernance, le faible niveau de connectivité sociale, la forte corruption sont d'importants obstacles à la globalisation urbaine dans les pays moins développés. L'existence d'un important secteur informel pourrait expliquer que les villes concernées s'accroissent au-delà de la taille compatible avec leurs ressources économiques et de leur capacité à engendrer des externalités favorables à la globalisation urbaine.

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